DOCKET SECTION

BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

POSTAL RATE AND FEE CHANGES, 1997

DOCKET NO. R97-1

RESPONSE OF MAGAZINE PUBLISHERS OF AMERICA WITNESS HIGGINS TO INTERROGATORY OF UNITED PARCEL SERVICE (UPS/MPA-NOI1-1)

(February 26, 1998)

Pursuant to the Commission's Rules of Practice, Magazine Publishers of America hereby submits the attached response to an interrogatory propounded by UPS to witness Higgins (UPS/MPA-NOI1-1).

Respectfully submitted,

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UPS/MPA-NOI1-1. Please confirm that the results you present on page 2, table 1, of your response to Notice of Inquiry No. 4 indicate that the data do not support the hypothesis that the slope parameters (or volume variability) are equal across all sites (for the activities tested).

RESPONSE:

Confirmed. I would note that the results even more emphatically reject the pooled model and the possibility that mail processing costs are 100 percent volume variable.

I would also note that rejection of the null hypothesis in a classical statistical hypothesis test may not be the only relevant issue to consider. Statistical theory suggests, at a minimum, two other criteria to consider when choosing a model: the use(s) to which inferences based on the model will be put, and the bias/variance tradeoff.

Regarding the first issue, witness Bradley has already made the point that the goal of his analysis was to obtain a single, reliable, nation-wide variability estimate for each cost pool. (Response of the United States Postal Service to Notice of Inquiry No. 4 on Mail Processing Variability at 12.) This fact would not change if the fixed-effects specification were abandoned in favor of a less restrictive alternative. The Commission would then have to decide how the various site-specific variabilities should be aggregated. I stated in my response to NOI No. 4 that I thought the weighted arithmetic mean (with each site's estimate weighted by its share in total piece-handlings) was the most reasonable choice, although other averaging techniques doubtless could be defended.[1]

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[1] It is clear that any reasonable method of averaging the site-specific variabilities would necessarily result in average variabilities less than 100 percent. This is because, as I discuss below, virtually all of the site-specific variabilities are less than 100 percent.

This raises the second issue: the tradeoff between bias and statistical efficiency. As your question emphasizes, the restriction that the slope parameters are constant across sites was shown to be inconsistent with the data in the *F* test requested in NOI No. 4 for each of the direct MODS operations. Imposing restrictions on a model that are not strictly correct implies that the least-squares estimator will be biased, albeit with smaller sampling errors.[2] And, on the other hand, while the unrestricted model is unbiased, it is relatively inefficient, which is to say that the parameter estimates of the unrestricted model have larger variances and, when considered separately, are unstable. This illustrates the nature of the tradeoff inherent in the choice between these two models: use of the fixed-effects model requires us to accept some potential bias in return for much tighter standard errors about the parameter estimates (as well as being able to avoid choosing an averaging methodology); use of the unrestricted model attains unbiasedness, but at a price of larger sampling errors.

In evaluating this tradeoff, the primary consideration should be the relative sizes of the bias and efficiency losses implied by each choice. In point of fact, the practical effect of making this choice is not that great: the average variabilities obtained using the two models are fairly close. The primary benefit afforded the Commission, the Postal Service, and the parties by the responses to NOI No. 4, in my opinion, is that it clearly shows that the old assumption of 100 percent variability of mail processing clerk and mailhandler costs is untenable. Witness Bradley's histograms illustrating the distributions of individual variabilities for four of the cost pools makes this point clearly: in each case, 90 percent or more of all of the individual variabilities in those four pools fall below the 100

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[2] See George G. Judge, W.E. Griffiths, R. Carter Hill, Helmut Lutkepohl, and Tsoung-Chao Lee, *The Theory and Practice of Econometrics*, 2nd edition, Wiley Series in Probability and Mathematical Statistics, 1980 at 52-54.

percent line. While it is possible to quibble with Professor Bradley about methodology, these graphs clearly show where the weight of the evidence lies.

DECLARATION

I, Paul Higgins, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information, and belief.

Paul Higgins

Paul Higgins

Date: 2-26-98

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the rules of practice.

James R. Cregan

Washington, D.C.
February 26, 1998